

What is claimed is:

1. A method of cleaning a semiconductor surface, comprising:
placing the semiconductor surface in contact with a carrier fluid;
forming a supercritical fluid adjacent to the semiconductor surface; and
changing a thermodynamic condition of the supercritical fluid to cause gas bubbles in the carrier fluid.
2. The method of claim 1, wherein forming a supercritical fluid includes forming a carbon dioxide supercritical fluid.
3. The method of claim 1, wherein forming a supercritical fluid includes forming a supercritical fluid from a group consisting of nitrous oxide, ethane, ethylene, propane, and xenon.
4. The method of claim 1, wherein forming a supercritical fluid includes forming a supercritical fluid from a group consisting of ethyl alcohol, ethyl ether and methyl alcohol.
5. The method of claim 1, wherein placing the semiconductor surface in contact with a carrier fluid includes placing the semiconductor surface in contact with de-ionized water.
6. The method of claim 1, wherein placing the semiconductor surface in contact with a carrier fluid includes immersing a semiconductor in an acid cleaning solution.
7. The method of claim 1, further including providing sonic wave energy to the carrier fluid.
8. The method of claim 1, further including brushing the semiconductor surface.

9. The method of claim 1, wherein forming a supercritical fluid includes adjusting both a pressure and temperature of a surrounding gas atmosphere to form the supercritical fluid.

10. The method of claim 1, wherein changing a thermodynamic condition includes changing both a pressure and temperature of the supercritical fluid.

11. A method of cleaning a semiconductor surface, comprising:
placing the semiconductor surface in contact with a carrier fluid;
forming a carbon dioxide supercritical fluid adjacent to the semiconductor surface; and
changing a thermodynamic condition of the carbon dioxide supercritical fluid to cause gas bubbles in the carrier fluid.

12. The method of claim 11, wherein placing the semiconductor surface in contact with a carrier fluid includes placing the semiconductor surface in contact with de-ionized water.

13. The method of claim 11, wherein placing the semiconductor surface in contact with a carrier fluid includes immersing a semiconductor in an acid cleaning solution.

14. The method of claim 11, further including providing sonic wave energy to the carrier fluid.

15. The method of claim 11, further including brushing the semiconductor surface.

16. A method of cleaning a semiconductor surface, comprising:
placing the semiconductor surface in contact with a carrier fluid;

forming a supercritical fluid adjacent to the semiconductor surface;
changing a thermodynamic condition of the supercritical fluid to cause gas bubbles in the carrier fluid; and
providing supplemental mechanical energy at the semiconductor surface in addition to the gas bubbles.

17. The method of claim 16, wherein forming a supercritical fluid includes forming a carbon dioxide supercritical fluid.

18. The method of claim 16, wherein placing the semiconductor surface in contact with a carrier fluid includes placing the semiconductor surface in contact with de-ionized water.

19. The method of claim 16, wherein placing the semiconductor surface in contact with a carrier fluid includes immersing a semiconductor in an acid cleaning solution.

20. The method of claim 16, wherein providing supplemental mechanical energy includes providing sonic wave energy to the carrier fluid.

21. The method of claim 16, wherein providing supplemental mechanical energy includes brushing the semiconductor surface.

22. A method of cleaning a semiconductor surface, comprising:
placing the semiconductor surface in contact with a carrier fluid;
forming a supercritical fluid adjacent to the semiconductor surface;
changing a thermodynamic condition of the supercritical fluid to cause gas bubbles in the carrier fluid; and
providing sonic wave energy to the carrier fluid.

23. The method of claim 22, wherein forming a supercritical fluid includes forming a carbon dioxide supercritical fluid.
24. The method of claim 22, wherein providing sonic wave energy to the carrier fluid includes providing ultrasonic wave energy to the carrier fluid.
25. The method of claim 22, wherein providing sonic wave energy to the carrier fluid includes providing megasonic wave energy to the carrier fluid.
26. A method of cleaning a semiconductor surface, comprising:
 - placing the semiconductor surface in contact with a carrier fluid;
 - forming a supercritical fluid adjacent to the semiconductor surface;
 - changing a thermodynamic condition of the supercritical fluid to cause gas bubbles in the carrier fluid; and
 - brushing the semiconductor surface.
27. The method of claim 26, wherein forming a supercritical fluid includes forming a carbon dioxide supercritical fluid.
28. The method of claim 26, wherein placing the semiconductor surface in contact with a carrier fluid includes placing the semiconductor surface in contact with de-ionized water.
29. The method of claim 26, wherein placing the semiconductor surface in contact with a carrier fluid includes immersing a semiconductor in an acid cleaning solution.
30. A method of forming a trench capacitor, comprising:
 - forming a trench in a semiconductor surface;
 - cleaning the trench, including:
 - placing the semiconductor surface in contact with a carrier fluid;

forming a supercritical fluid adjacent to the semiconductor surface;
changing a thermodynamic condition of the supercritical fluid to
cause gas bubbles in the carrier fluid;
forming an insulator layer within the trench; and
forming a conductive plate over the insulator layer.

31. The method of claim 30, wherein forming a supercritical fluid includes forming a carbon dioxide supercritical fluid.
32. The method of claim 30, wherein forming a supercritical fluid includes forming a supercritical fluid from a group consisting of nitrous oxide, ethane, ethylene, propane, and xenon.
33. The method of claim 30, wherein forming a supercritical fluid includes forming a supercritical fluid from a group consisting of ethyl alcohol, ethyl ether and methyl alcohol.
34. The method of claim 30, further including providing sonic wave energy to the carrier fluid.
35. The method of claim 30, further including brushing the semiconductor surface.
36. A method of forming a device contact, comprising:
forming an opening within an insulator layer located over a device;
cleaning the opening, including:
placing the insulator layer in contact with a carrier fluid;
forming a supercritical fluid adjacent to the insulator layer;
changing a thermodynamic condition of the supercritical fluid to cause gas bubbles in the carrier fluid; and
depositing a conductor material within the opening.

37. The method of claim 36, wherein forming a supercritical fluid includes forming a carbon dioxide supercritical fluid.
38. The method of claim 36, wherein forming a supercritical fluid includes forming a supercritical fluid from a group consisting of nitrous oxide, ethane, ethylene, propane, and xenon.
39. The method of claim 36, wherein forming a supercritical fluid includes forming a supercritical fluid from a group consisting of ethyl alcohol, ethyl ether and methyl alcohol.
40. The method of claim 36, wherein forming the opening within the insulator layer located over the device includes forming an opening within an insulator layer located over a portion of a transistor.
41. A method of cleaning a semiconductor assembly, comprising:
 - placing the semiconductor assembly in contact with a carrier fluid;
 - forming a supercritical fluid adjacent to the semiconductor surface;
 - changing a thermodynamic condition of the supercritical fluid to cause gas bubbles in the carrier fluid.
42. The method of claim 41, wherein forming a supercritical fluid includes forming a carbon dioxide supercritical fluid.
43. The method of claim 41, wherein placing the semiconductor assembly surfaces in contact with a carrier fluid includes immersing the semiconductor assembly in a halogenated hydrocarbon fluid.

44. The method of claim 43, wherein immersing the semiconductor assembly in a halogenated hydrocarbon fluid includes immersing the semiconductor assembly in a clorocarbon solvent.

45. The method of claim 43, wherein immersing the semiconductor assembly in a halogenated hydrocarbon fluid includes immersing the semiconductor assembly in a clorofluorocarbon solvent.

46. The method of claim 41, further including providing sonic wave energy to the carrier fluid.

47. A method of forming an information handling system, comprising:
forming a memory device, including:
fabricating a memory circuit on a semiconductor surface;
cleaning the semiconductor surface, including:
placing the semiconductor surface in contact with a carrier fluid;
forming a supercritical fluid adjacent to the semiconductor surface;
changing a thermodynamic condition of the supercritical fluid to cause gas bubbles in the carrier fluid; and
coupling the memory device to a processor device.

48. The method of claim 47, wherein the steps are performed in the order presented.

49. The method of claim 47, wherein forming a memory device includes forming a dynamic random access memory device.

50. The method of claim 47, wherein forming a supercritical fluid includes forming a carbon dioxide supercritical fluid.